



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

GEOMETRY.

489. Proposed by NATHAN ALTSHILLER, The University of Colorado.

The parallels to the asymptotes a, b of a given hyperbola, drawn from a variable point of the curve, meet a and b in P, Q respectively. The line PQ envelops an hyperbola whose asymptotes are a and b .

490. Proposed by ELMER E. MOOTS, University of Arizona.

In any quadrilateral $ABCD$, let AC and BD be the diagonals intersecting in K . On AC , lay off CR equal to AK . Join B and R . Connect the middle point G of BR with D . On GD , lay off GM equal to $\frac{1}{3}GD$. Show that M is the center of gravity of the quadrilateral.

491. Proposed by N. P. PANDYA, Sojitra, India.

In a triangle $mx = b$ and $nx = c$, determine a relation between m, n, x, A and s and solve it for x .

CALCULUS.

407. Proposed by PAUL CAPRON, Annapolis, Maryland.

A coffee pot in the form of a conical frustum, 10 inches high, with a lower base 8 inches in diameter and an upper base 6 inches in diameter, is held on a slant so that the lower base is barely covered by the coffee within, and the upper base is barely uncovered. How much coffee does the pot contain?

408. Proposed by CLIFFORD N. MILLS, Brookings, South Dakota.

The ellipse $(x^2/81) + (y^2/16) = 1$ is revolved around the y -axis. Find the area of the surface generated.

409. Proposed by B. J. BROWN, Victor, Colorado.

Integrate the equation

$$\frac{\partial^2 z}{\partial x \partial y} + \frac{1}{x+y} \left(\frac{\partial z}{\partial x} + \frac{\partial z}{\partial y} \right) - \frac{2}{(x+y)^2} z = 0.$$

MECHANICS.

326. Proposed by CLIFFORD N. MILLS, Brookings, South Dakota.

A uniform beam, of length $2l$, rests in equilibrium against a smooth vertical wall and upon a peg at a distance a from the wall; show that the inclination of the beam to the vertical is

$$\sin^{-1} \left(\frac{a}{l} \right)^{\frac{1}{2}}.$$

327. Proposed by C. N. SCHMALL, New York City.

An inclined plane makes an angle ϕ with the horizontal plane, and from its foot a body is projected upward at an angle ψ to the plane, and with velocity v . Show that it will strike the plane *perpendicularly* if $\tan \psi = \frac{1}{3} \cot \phi$ and that its range up the plane in that case will be

$$\frac{2v^2 \sin \phi}{g(1 + 3 \sin^2 \phi)}.$$

NUMBER THEORY.

244. Proposed by CLIFFORD N. MILLS, Brookings, South Dakota.

Determine the rational value of x that will render $x^2 + px + q$ a perfect square. What value of x will render $x^2 - 7x + 2$ a perfect square?

245. Proposed by NORMAN ANNING, Chilliwack, B. C.

When all the letters denote positive integers and when the a 's are primes of the form $4k + 1$, the equation